

## CLAIMS

1. A frequency shifting device comprising:  
first means for providing a layer of optically refractive material having a moving refractive boundary responsive to an application of a traveling wave electrical signal and  
second means for providing an electrical signal to said first means effective to  
5 effect a predetermined frequency shift of an optical signal passing therethrough.
2. The invention of Claim 1 wherein said device includes an active polymer layer and a first optically conductive cladding layer above.
3. The invention of Claim 2 wherein said device further includes a microstrip line disposed over said first cladding layer.
4. The invention of Claim 3 further including an optically conductive second cladding disposed beneath said active polymer layer.
5. The invention of Claim 4 further including a ground plane beneath the said second cladding layer.
6. The invention of Claim 5 further including a quartz or silicon substrate disposed beneath said ground plane.

7. A frequency shifting device comprising:

  - a substrate;
  - a ground plane disposed over said substrate;
  - an optically conductive second cladding layer disposed over said ground plane;
  - 5 an active polymer disposed over said second cladding layer;
  - an optically conductive first cladding layer disposed over said active polymer,
  - a microstrip line disposed over said first cladding layer.
  
8. A continuous wave frequency converter comprising:

  - first and second frequency shifting devices disposed in first and second optical paths respectively, each of said devices having a layer of optically refractive material with a moving boundary responsive to the application of an electrical signal and
  - 5 means for providing an electrical signal to said first and second devices.
  
9. A method for continuous wave frequency shifting of an optical signal comprising the steps of:

  - providing layers of optically refractive material having a moving refractive boundary responsive to an application of a traveling wave sinusoidal electrical signal and
  - 5 providing electrical signals to said layers to effect a predetermined frequency shift of an optical signal passing therethrough.